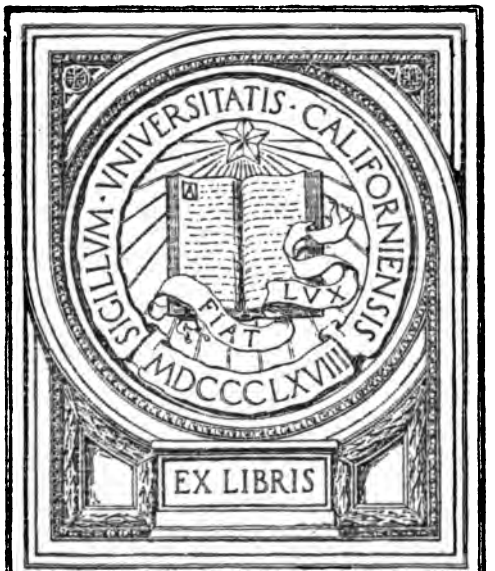

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INDIVIDUALITY

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EDITOR'S INTRODUCTION

THE teaching profession is showing signs of a somewhat violent reaction against the uniformity of method that for so long clutched and mechanized the schools. Long before teachers realized the deadening effects of uniformity, there had been many protests from outside the teaching fold; but they had availed little in focussing professional attention. Parents had noticed that vigor and freshness were departing from the teaching in our public schools. Youth at high schools and colleges had in their own way filed their protest by turning from the unappealing work of classrooms to affairs of their own invention, to school sports and sociability. But the professional consciousness was not deeply penetrated until the teachers themselves were caught in the iron machinery of their own making. When the supervision of teachers became as inflexible and as unindividual as the teaching of children, the problem of individu-

ality in education became an acute professional one. Particularly was this true in large city school systems, where the mere bigness of the situation obscured both the individual teacher and the individual child.

Of course there have been other forces contributing to this awakening to the need of conserving and developing individuality. Great institutional movements are far too complex to be explained simply, — one set of forces seldom operates without assistance from many others.

The growing belief that the education of all children is a public duty initiated difficulties that forced attention to the need of individual treatment of children. The schools of an older generation took care of a selected group. Those children to whom a more or less formal and abstract intellectual life appealed went to school and remained; the others either did not enter school at all or soon left for more congenial employment. The traditional methods of schoolroom procedure were adapted only to a picked lot of children. The effect of compulsory educa-

tion upon the school was therefore sweeping. All varieties of children were compelled to attend a school the traditional methods of which fitted only a few. The maladjustments became apparent. The old uniform methods broke down before the needs of a new, enlarged, and more varied population. Children were eliminated from school or retarded in their school careers to such a degree as seriously to indict the school system. The cry for individual adjustment became a shibboleth among the reformers; and it found a ready echo in the city teacher who found herself becoming a pedagogical mechanic under the uniform standards imposed from above.

The growth of cities also emphasized existing maladjustments. The heterogeneous school populations of large industrial and commercial centres embrace a wide distribution of economic groups and classes. The evidence of so great variation in pupils in the schools of these cities helped the school men of the country to realize that variety is one of the chief characteristics of human nature. To be sure the observed differences in individuals were often due

more to environment than to original causes, and were frequently more apparent than real; the effect, however, was even more pronounced than if the teachers had possessed an accurate, scientific view of natural and fundamental variations among men. The call for special schools, smaller classes, and specialized methods of teaching was prompt, though not always intelligent. The city school system afforded an easy administrative opportunity for handling such special classes. In a congested population there would be enough deaf and dumb, or cripples, or juvenile delinquents, or truants, or tubercular children to warrant the establishment of special schools or classes. Hence the large city easily furnished examples of ways of providing for better adjustment to individuality, and became the initiator, as well as the pattern, of new movements of this kind.

It is probable, too, that the child-study movement in education gave assistance to the other factors that were breaking up the uniform methods of the traditional school. It took the attention off certain ready-made conceptions as

to what the human mind is, and turned it toward the study of the children themselves. The concrete acts of many children, observed under all sorts of conditions, could not help but stimulate the growing belief that childhood has infinite variety.

As a result of these major forces, and of some other minor ones at work in our professional thought, the reaction against the blight of uniformity in teaching has deepened. It has expressed itself positively in the demand for administrative and instructional means that will produce an increased regard for individuality. For the most part this revolution — for it has been nothing less — in point of view, was a rebellion of common sense against an obvious wrong. It moved in the right direction, but, as is the case when common sense is the sole guide, it advanced without much refinement of either knowledge or methods.

To escape from the tyranny of traditional notions as to what constitutes an average child under average conditions, and to reach the belief — general and vague though it be — that

schools must be respecters of individuality, is surely a sign of progress. But our pupils will never reap the full benefit of this changed point of view until we know specifically to what extent individuals vary and what are the causes of this variation; as well as the particular practical implications of these scientific truths.

Unfortunately the truths of such a complex problem as that of human individuality are now only in the process of scientific reduction. In so far as they exist and may be presented in restricted compass, they are summarized in the volume here presented. But this contribution of Professor Thorndike's is significant for more than its incidental summary of known facts; for it establishes a point of view and indicates a safe method of approach to this intricate study of human nature. With ingenious clarity and brilliant suggestiveness, coupled with scientific caution and accuracy, the author has given us the fundamental modes by which uniformities and variations are to be perceived in human nature; has stated their general and specific causes; and has pointed out their meaning for so-

cial policy. Even the casual reader of this monograph cannot fail to appreciate its bearings upon much that passes as truth in both popular belief and professional theory.

INDIVIDUALITY

I

THE NATURE OF INDIVIDUAL DIFFERENCES

THE life of a man is a double series — a series of effects produced in him by the rest of the world, and a series of effects produced in that world by him. A man's make-up or nature equals his tendencies to be influenced in certain ways by the world and to react in certain ways to it. To describe even one man's intellect and character fully, at even any one time, it would be necessary to list all the world's happenings that he might possibly encounter, and to state in each case how he would feel and think and act in response to that happening.

If we could thus adequately describe each of a million human beings, — if, for each one, we could prophesy just what the response would be to every possible situation of life, — the million men would be found to differ widely. Probably no two out

of the million would be so alike in mental nature as to be indistinguishable by one who knew their entire natures. Each has an individuality which marks him off from other men. Each has not only *a* mind, the mind of the human species, but also his own, specialized, particular, readily distinguishable mind. Even in bodily nature, indeed, men differ so much that it would be hard to find, amongst a million, two whose features are just alike, who are equally susceptible to every disease, who have identical bodily habits. The differences in intellect and character are far greater.

We may study a human being in respect to his common humanity, or in respect to his individuality. In other words, we may study the features of intellect and character which are common to all men, to man as a species; or we may study the differences in intellect and character which distinguish individual men.

The study of the facts and laws applicable to all men by virtue of their common humanity gives education its fundamental rules for the control of changes in intellect and character. The

study of the facts and laws of individual differences enables us to apply these principles economically in the case of each individual whom we seek to educate.

In studying individual differences, it is customary to reduce the infinitude of tendencies to think and feel and act in certain ways in response to the varied situations which life offers, to the more general, and so fewer, tendencies which the psychologist calls abilities, interests, habits, qualities of mind, or mental traits. Thus the hundreds of connections between the situations represented by all the possible problems in addition and the responses represented by all their solutions, are reduced to the one trait, "ability to add." Thus the many inborn connections between, on the one hand, seeing and touching blocks, sand, strings, wire, stones, water, and other material objects, and on the other hand examining, poking, pulling, putting together, taking apart, forming and re-forming those objects, are comprised in the one trait, "the instinct of constructiveness" or "the interest in manipulation." Thus by such a term as "memory for fig-

ures" we refer to the permanence of many connections, — the thought of a battle with its date, the thought of a person with his address or telephone number, the thought of a city with its number of inhabitants.

Individuals are commonly considered as differing in respect to such traits either quantitatively or qualitatively, either in degree or in kind. A quantitative difference exists when the individuals have different amounts of the same trait. Thus, "John is more attentive to his teacher than James is," "Mary loves dolls less than Lucy does," "A had greater devotion to his country than B had," are reports of quantitative differences, of differences in the amount of what is assumed to be the same kind of thing. A qualitative difference exists when some quality or trait possessed by one individual is lacking in the other. Thus, "Tom knows German, Dick does not," "A is artistic, B is scientific," "C is a man of thought, D is a man of action," are reports of the facts that Tom has some positive amount or degree of the trait "knowledge of German" while Dick has none of it, that A has some posi-

tive amount of ability and interest in art while B has zero, whereas B has a positive amount of ability and interest in science, of which A has none, and so on.

A qualitative difference in intellect or character is thus really a quantitative difference wherein one term is zero, or a compound of two or more quantitative differences. All intelligible differences are ultimately quantitative. The difference between any two individuals, if describable at all, is described by comparing the amounts which A possesses of various traits with the amounts which B possesses of the same traits. In intellect and character, differences of kind between one individual and another turn out to be definable, if defined at all, as compound differences of degree.

If we could list all the traits, each representing some one characteristic of human nature, and measure the amount of each of them possessed by a man, we could represent his nature — read his character — in a great equation. John Smith would equal so many units of this, plus so many units of that, and so on. Such a mental

inventory would express his individuality conceivably in its entirety and with great exactitude.

No such list has been made for any man, much less have the exact amounts of each trait possessed by him been measured. But in certain of the traits, many individuals have been measured; and certain individuals have been measured, each in a large number of traits. I shall state first some of the more important results of the measurements of individual differences in the case of single traits, differences in the amount of the same kind of quality or thing.

INDIVIDUAL DIFFERENCES IN SINGLE TRAITS

It is useless to recount the traits in which men have been found to differ. For there is no trait in which they do not differ. Of course if the scale by which individuals are measured is very coarsely divided, their differences may be hidden. If, for example, ability to learn is measured on a scale with only two divisions, (1) "ability to learn less than the average kitten can" and (2) "ability to learn more than the average kitten can," all men may be put in class two, just as if their

heights were measured on a scale of one yard, two yards, or three yards, nearly all men would alike be called two yards high. But whenever the scale of measurement is made fine enough, differences at once appear.

Their existence is indubitable to any impartial observer. The early psychologists neglected or failed to see them precisely because the early psychology was partial. It believed in a typical or pattern mind, after the fashion of which all minds were created, and from which they differed only by rare accidents. It studied "the mind," and neglected individual minds. It studied "the will" of "man," neglecting the interests, impulses, and habits of actual men.

The differences exist at birth and commonly increase with progress toward maturity. Individuality is already clearly manifest in children of school age. The same situation evokes widely differing responses; the same task is done at differing speeds and with different degrees of success; the same treatment produces differing results.

There can be little doubt that of a thousand

ten-year-olds taken at random, some will be four times as energetic, industrious, quick, courageous, or honest as others, or will possess four times as much refinement, knowledge of arithmetic, power of self-control, sympathy, or the like. It has been found that amongst children of the same age and, in essential respects, of the same home training and school advantages, some do in the same time six times as much, or do the same amount with only one tenth as many errors.

The ways in which and the extent to which individuals differ in mental traits can be best understood by considering the *Distribution* of the trait, that is, the number of individuals possessing each degree of it. For example, the distribution of stature in American boys ten and a half years old is roughly as follows.

Out of 1000 boys, there are:—

Between	109	and	113	centimetres	tall,	2	boys.
"	113	"	117	"	"	5	boys.
"	117	"	121	"	"	25	boys.
"	121	"	125	"	"	97	boys.
"	125	"	129	"	"	199	boys.
"	129	"	133	"	"	255	boys.

Between	133	and	137	centimetres	tall,	228 boys.
"	137	"	141	"	"	126 boys.
"	141	"	145	"	"	49 boys.
"	145	"	149	"	"	11 boys.
"	149	"	153	"	"	4 boys.

The facts of this table become clearer to the eye if, instead of the numbers 2, 5, 25, 97, etc.,

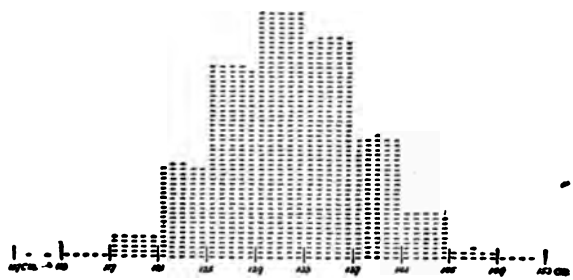

FIG. 1. The Distribution of Stature of American Boys 10½ yrs. old.

we draw 1000 little lines as in Figure 1, letting each line stand for one boy.

It is customary to represent the amounts of the trait not by a verbal statement like "from 109 cm. to 113 cm.," but by a distance along a scale from the point on the scale marked 109 cm. to the point marked 113 cm.; and to represent

the number of individuals who possess that degree of the trait not by the number of lines, but by the size of an area. The previous table then becomes Figure 2.

Such a figure is called the *Surface of Distribution* of the trait. Such distribution tables or surfaces are, so to speak, the language of individual

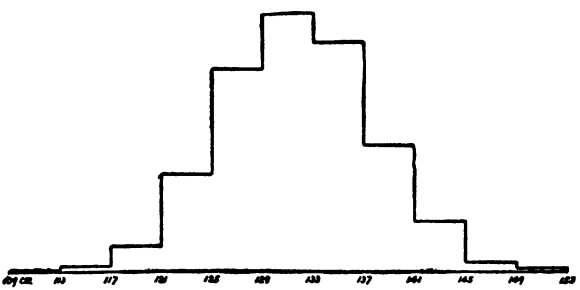

FIG. 2. The Distribution of Stature of American Boys 10½ yrs. old, the relative frequencies being measured by area.

psychology. They tell us what the "type" or "norm" or common tendency is, how and how far individuals vary from the type, whether there are secondary or sub-types, how "abnormal" any given degree of the trait is, and the like. For instance, in the case of our illustration, it is clear

that there is one central tendency, the typical height for a boy of this age being about 133 cm.; that slight individual variations from the type are very numerous, but that large variations from it are very rare; that the variations are continuous, individuals being found of every height from 110 cm. to over 150 cm.; that a boy over 149 cm. tall at the age of ten and a half would be abnormal in the sense that he would occur only once in two hundred and fifty times, but would not be abnormal in the sense of being removed from ordinary children by a distinct gap.

All thought about individual differences in single traits should be carried on in terms of such distribution tables or surfaces, each derived from the actual measurement of a large and representative group of individuals. It is misleading to form opinions from casual observations of human nature without accurate measurements. For casual observation is struck by extreme, odd, exciting, and desired facts. It notes, for example, that two railroad wrecks occurred at the same day and hour, that it has not rained for

two months, that Walter Scott was thought dull as a boy, that the rule of the Republican party has greatly increased (or decreased) prosperity. It is misleading to judge from measurements of a few individuals. For their meaning can be rightly seen only by comparison with the total distribution in respect to the trait in question. In theory and in practice, we must think of an individual in any one trait not only as he is in and of himself, but as he is in relation to all men, —as one variation amongst others in the total distribution in respect to that trait. There is indeed no one habit of thought about human nature more important for the understanding of individuality than the habit of thinking of the different amounts or degrees of each single quality or trait as distances along a scale, and of men and women as distributed along that scale each at his proper point.

The study of such distributions in the case of qualities of intellect and character, has brought to light two facts, both at variance with common opinion and both of importance for the practical control of individuals by schools, laws, books, and the

like. First, *the variations in any single trait are usually continuous.* Second, *the variations usually cluster around one and only one type.*

The continuity of variations appears in every trait that has so far been measured. Children rarely or never fall into distinct classes with gaps between, — bright, average, and dull, sane and insane, visualizers and non-visualizers, color-seeing and color-blind, and the like. On the contrary, between the least and the greatest, the best and the worst, every degree is represented.

The clustering around one type, though not perhaps as universal as the continuity of variations, is also to be expected, save under certain special conditions in the causes that produce the trait.[1] The true state of affairs is that shown by such distributions as those of Figure 3, not by such as those of Figure 4. We must not be misled, by the habit of thinking in words, into the false belief that individualities are grouped into

[1] The discussion of these causes is somewhat intricate and out of place in this brief exposition. The reader will find the essential facts in the author's *Educational Psychology*, pp. 150–170.

classes to fit those words. The usages of language are rarely competent to express the real fact of variations clustering around one type or mode

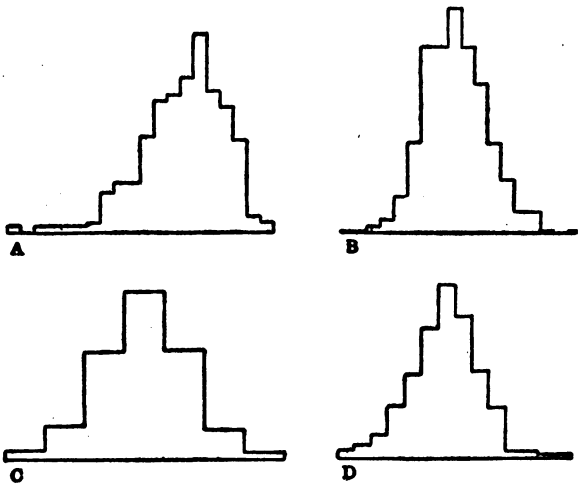

FIG. 3. Actual Distributions found in Mental Measurements.
A. Reaction time of college freshmen.
B. Efficiency in marking A's on a sheet of printed capitals; 12-year-old boys.
C. Memory of digits of women students.
D. Efficiency in writing the opposites of words; 12-year-old boys.

and, as the variation increases, occurring in ever-diminishing frequency. That we call children good or bad does not mean that there are two

types or modes of character. That the words "deficient," "normal," and "superior" are used of any trait is no proof that individuals in that trait show a separation into three groups, all in one group being much like one another and little like any of those in the other groups.

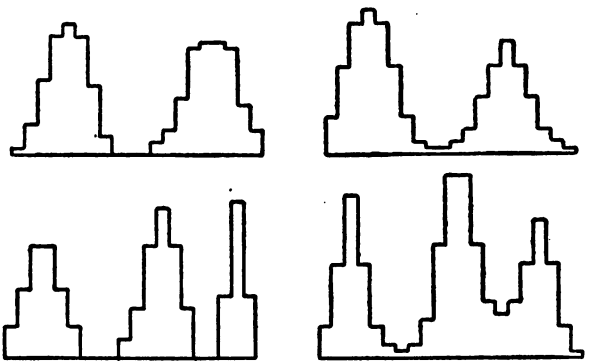

FIG. 4. Distributions around Several Distinct Types, such as are NOT commonly found to exist.

We must learn to think of the degree or amount of any quality in an individual not by an adjective, but by a numerical amount. We must keep all men in one class or species, or divide them into two, three or more classes or species, according to the way they are in fact divided, not

according to rhetorical convenience. In the great majority of single traits, there is only one type or mode, so that any division into distinct classes according to the amount of the trait is arbitrary. The distribution being as in Figure 5, it is equally possible to divide individuals into two, three, four, five, six, seven, eight, or eight hundred classes; and for any given number of classes one may put

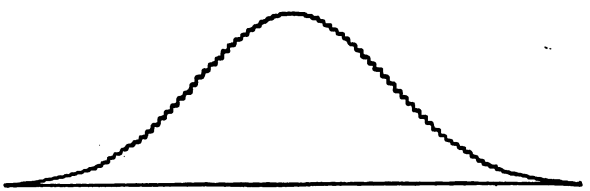

FIG. 5. A Generalized Picture of the Form of Distribution to which the Actual Distributions approximate.

the dividing lines in one place as well as another. Consequently classifications of individuals with respect to the amount of any single trait are almost always useless if not misleading. The story is to be told, not by a series of names, but by a surface of distribution erected on a numerical scale.

Turning again to Figure 3, one notes that all

the distributions there shown have, as a common feature, the great frequency of mediocrity and the rareness of both specially low and specially high degrees of a trait. Approximately this is the rule for the original individualities of mankind. Approximately this remains the rule for many traits throughout the course of life and its training. In many traits a very small difference in ability or attitude near the middle point of the scale includes a great many individuals. This fact explains much in human behavior. For instance, social and political movements are often instigated by individuals who are at the extremes of the scale with respect to some doctrine. But the deciding votes are almost always cast by individuals who have no very pronounced inclination in either direction. The attractiveness of some hero, the suggestive power of some battle-cry, an affront to the sense of fair play, a year of hard times, a moderate expenditure of money, even the mere desire for novelty, may turn the balance, because only a slight addition to the attractiveness of one proposal is needed to move a great number of those near the point of neutrality. To overturn a large majority

requires only a small change in opinion. A slight improvement in teaching may make a misunderstood point clear to a large percentage of the class.

The facts that have been stated concerning the distribution of single traits teach, with respect to their educational control, that any method which is the best possible for those of one degree of a trait cannot be the best possible for all individuals. Nor will two or three varieties of treatment suffice to educate all in the best way. Variations in human nature are wide and continuous, so that theoretically treatment also must vary much and continuously.

It is not possible with ordinary facilities thus to give each individual in each trait the best possible treatment, but knowledge of the amount and distribution of variations will prevent certain blunders. For example, a division into three groups is usually very much preferable to a division into two groups, but the gain by adding a fourth is far less. One change in school practice to make it more conformable to individual differences is entirely practicable. Since the variations in any trait are so wide, a pupil should always be

measured, not only, as now, by his ability in comparison with his fellows, but also by his improvement over his own past record. School marks should be on absolute as well as relative scales.[1] A child should be given a measure of *change* as well as of present inferiority or superiority to some standard in the teacher's mind.

INDIVIDUAL DIFFERENCES IN COMBINATIONS OF TRAITS

The variety of human nature possible when one man is compared with others in respect to all possible traits is practically infinite. Even if man's nature included only five traits, *a*, *b*, *c*, *d*, and *e*, and even if each of these existed in only five degrees, 1, 2, 3, 4, and 5, there could be over three thousand (3125, to be exact) varieties of men. With hundreds of traits, each represented in hundreds of degrees, the varieties possible are practically infinite. All the principles involved can, however, be understood in a simplified case such as that of the five traits, each appearing in

[1] For a description of such an absolute scale see the author's "Handwriting," *Teachers College Record*, March, 1910.

five degrees. In the simple case any one individual would be represented by an equation such as :—

$$\text{W. Roberts} = 2a + 2b + 5c + 3d + 3e,$$
$$\text{John Smith} = 1a + 4b + 2c + 5d + 1e,$$
$$\text{H. Thomas} = 4a + 1b + 1c + 2d + 3e,$$

or, more clearly, by a series of points on the five scales for the five traits as in Figure 6.

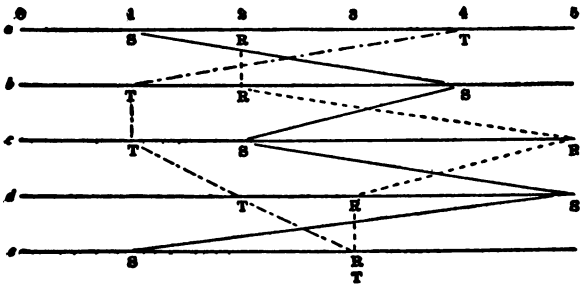

FIG. 6. Three Individuals, R, S, and T, each measured in the case of Five Traits, *a*, *b*, *c*, *d*, and *e*, as possessing 1, 2, 3, 4, or 5 degrees thereof.

Over three thousand varieties are possible, but they need not all occur. For example, suppose that the amount of trait *a* that an individual possessed was so related with the amounts of *b*, *c*, *d*, and *e* that he possessed, that if he had *2a* he would have also *2b*, *2c*, *2d*, and *2e*, while if he

had $4a$ he must have $4b$, $4c$, $4d$, and $4e$, and similarly for $1a$, $3a$, and $5a$. Then the only varieties of individuals that could exist would be:—

Some who were $1a + 1b + 1c + 1d + 1e$,
" " " $2a + 2b + 2c + 2d + 2e$,

and so on, five varieties in all, shown in Figure 7. Or suppose that an individual having $5a$ could

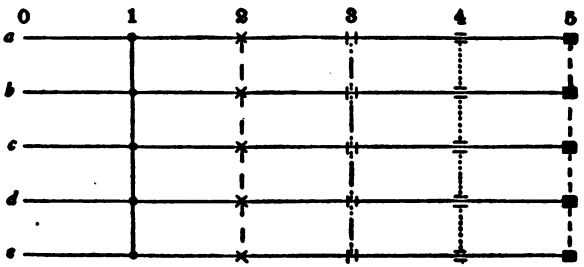

FIG. 7.

never have less than 3 of b, c, d, and e. Then such individualities as —

$5a + 2b + 4c + 3d + 5e$,
$5a + 5b + 1c + 4d + 3e$,

and the like could not exist. The kind of varieties that can exist will then express the relations, or, as they are commonly called, the *correlations*, between the amounts of the five traits, that is,

the extent to which the amount of one trait possessed by an individual is bound up with the amount which he possesses of some other trait. This is as true for five hundred traits as for five, and for an infinite number of degrees of each as for five degrees. *What kind of individuals there will be, and what proportion there will be of each kind, is a result of the distribution of individuals in single traits and of the correlations of the traits.* To this fact we shall soon need to return.

Confronted by the infinite variety of total human natures, thinkers have hoped to find certain types, — the genius, the insane, the criminal, the defective, the artist, the man of affairs, and the like, — such that all, or at least many, individuals would belong under one or another of these types. A type represents some particular combination of amounts of the list of human traits. For example, suppose the list of traits to be a, b, c, d, and e, and the degrees of each to range from 0 to 10. Then

$$\text{(I)}\quad 2a + 5b + 5c + 8d + 10e,$$
$$\text{(II)}\quad 10a + 2b + 2c + 1d + 0e,$$
$$\text{and (III)}\quad 4a + 4b + 4c + 6d + 5e,$$

would be possible types. They are represented graphically in Figure 8.

Now such individuals as:—

(1) $1a + 4b + 5c + 9d + 9e$,
or (2) $3a + 4b + 5c + 8d + 10e$,
or (3) $2a + 5b + 6c + 8d + 10e$,

obviously vary little from Type I, but much from Type II or Type III.

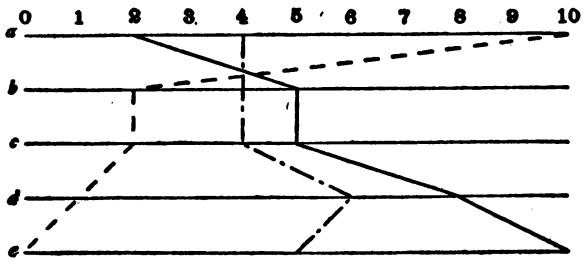

FIG. 8. Three Possible Types.

Such individuals as—

(4) $10a + 1b + 2c + 0d + 2e$,
(5) $9a + 2b + 2c + 2d + 1e$,

vary little from Type II, but much from Type I or III. Consider similarly such individuals as:—

(6) $4a + 5b + 4c + 6d + 3e$,
(7) $2a + 4b + 4c + 5d + 4e$.

These facts are easily seen in Figure 9, which represents Types I, II, and III and individuals 1 to 7.

The customary view has been that "types," or particular combinations of amounts of human traits, could be found so that any individual would be much like some type and much less like any

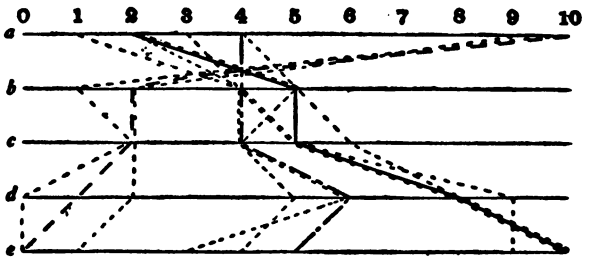

FIG. 9. The Three Types of Fig. 8, and Seven Individuals, each conforming closely to one or another of the three types.

of the others. But no one has succeeded in finding such types, and the more clearly the supposed types are defined, the surer it becomes that intermediate conditions, equally like several of the types, exist in great numbers. Either new types have to be added until there are so many that one may as well let each individual be his

own type; or the number of individuals not falling readily under any type is so large that the attempt to classify men by them hinders rather than helps thought and practical control. Only very rarely can anything approaching at all closely to an accurate and adequate account of a man's individuality be given by the statement that he is of this or that "type."

In fact, there is much reason to believe that human individualities do not represent ten or a hundred or a thousand types, but either *one single type* or *as many types as there are individuals*, according to whether the thinker wishes to emphasize the mode around which they vary or the exact nature of their variations from it. By this view the effort to assign individuals to a number of classes, as we assign animals to the classes "mammals," "reptiles," "amphibians," "fishes," etc., is doomed to failure or incompetence. The first duty of the thinker is to learn the constitution of the one type, man. His second duty is to learn each individual's variation from this common humanity. In theory it means that man is mentally, as much as physically, one

species. In practice it means that each individual must be considered by himself.

It certainly is the case that almost all of the detailed classifications of individuals in accord with the multiple-type theory are either useless or misleading. The commonest element in such classifications is the supposed principle of compensation or balance, whereby, for example, a "quick but careless" type is contrasted with a "slow but sure" type; or an "easy learning, quickly forgetting" type is contrasted with the slow learner who retains long; or efficiency in thought, efficiency in action, and delicacy in sentiment are supposed to be exclusive, each of the other two. Such types, presupposing relations of compensation between intrinsically desirable traits, are almost certainly illusory.

All trustworthy studies so far made of the relations between the amounts of desirable single traits in the same individual agree in finding direct or "positive" relations between such traits. Having a large measure of one good quality *increases* the probability that one will have more than the average of any other good quality. He

who can learn better than the average through the eyes, tends to learn better than the average through the ears also; he who can attend to one thing better than all other men, will be able to attend to many things at once or in rapid succession better than most of them. Artistic ability, as in music, painting, or literary creation, goes *with* scientific ability and matter-of-fact wisdom. The best abstract thinker will be above the average in concrete thought also. The rapid workers are the more accurate. Intellectual ability and moral worth hang together.

The correlations are, of course, not perfect. A large degree of superiority in one desirable trait may involve only a slight superiority in many others. And since the relations vary enormously amongst individuals, a person highly gifted in one respect will often, though not usually, be very inferior in others.

The description which I have given of the varieties of total human nature doubtless seems to the reader to be far from clear. We have seen that millions upon millions of different conditions

of traits may exist; that a large fraction of them do exist; that they do not divide naturally into distinct types, but probably vary around one type; and that efficiency in one respect is positively correlated with efficiency in others. We may add that, in general, the greater the variation from the one common type of "the ordinary individual," the rarer it is. But we have failed to get a neat, handy summary of the varieties of mankind. Their multitudinous complexity and richness remains to baffle the mind.

The fact is that a simple, orderly, tidy chart of human geography would be sure to be a false one, and that until inventories of the amounts of hundreds of traits are made for many individuals, we have no right to construct such a chart of any sort. Even by original nature, intellect and character are enormously diversified, and differences in training add new complexities. For the present each individual's equation must be written out as a result of a direct examination of his whole make-up, not inferred from a few symptoms, plus a hasty general theory of individuality.

II

THE CAUSES OF INDIVIDUAL DIFFERENCES

No competent thinker to-day doubts that every slightest feature of every man's individuality has a natural cause. Men and women are always what they are for some reason; and the reason is some fact in the real world. No mere chances, fairies, or demons impregnate a human mind with its peculiarities. Each comes as a result of natural law, and could be predicted by a perfect intelligence in possession of all the facts.

Sex, remote ancestry or race, immediate ancestry or family, growth or maturity, and that total of forces operating on a man's nature which we call the environment, all contribute to explain why any one man is what he is. To review some of the main facts about the influence of these factors is the aim of this chapter.

THE INFLUENCE OF SEX

What little scientific study of the differences between the sexes in intellect and character there

has been, tends to minimize the traditional conception that they are two distinct kinds of beings, never understanding one another and requiring very different kinds of treatment. On the contrary, it appears that if the primary sex characters — the instincts directly related to courtship, love, child-bearing, and nursing — are left out of account, the average man differs from the average woman far less than many men differ one from another.

In no trait of those studied has a gap been found between the distributions for the two sexes. The upper extreme of one sex always overlaps the lower extreme of the other. Some girls like to fight better than some boys; some men are fonder of babies than some women.

The overlapping is, in most of the traits studied, very great. For example, popular belief would perhaps select as impressive sex differences the greater originality, activity, independence, and frankness of the male, and the greater emotionality, interest in personal appearance, and religiousness of the female. These are indeed probably among the largest sex differences. But, so

far as is known, the overlapping in these cases is approximately as shown in Figure 10. Nearly all women are more original than the least original man, and probably over a third of women are more original than the average man. Nearly all men are more religious than the least religious woman, and probably about a third are more religious than the average woman.

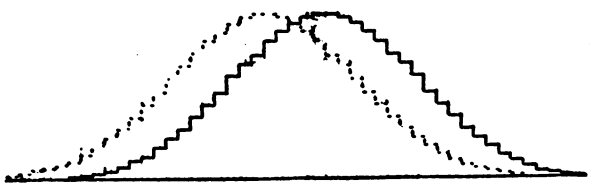

FIG. 10.

In a study by indirect methods, whose results therefore are somewhat insecure, Heymans and Wiersma found as the greatest difference between men and women that in the relative strength of the interest in things and their mechanisms (stronger in men) and the interest in persons and their feelings (stronger in women). The difference is a trifle greater than that shown in Figure 11. Other differences not so large are

that being a man tends to make an individual more vigorous in movement, more athletic and noisy, more independent, less sensitive to slight outside stimuli, less efficient in perceiving small details, more often color-blind, a trifle less quick to memorize, less shy and conscientious, lazier and fonder of games of skill, mental or bodily, less emotional, less eager for change, quicker in recovery from grief, and less impulsive.

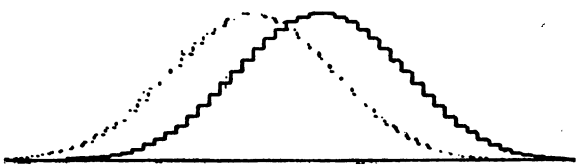

FIG. 11.

The prevailing overestimation of maleness and femaleness as determinants of intellect and character is probably due to two causes. In the first place, literary presentations of the human nature of men and women have been concerned largely with men and women in courtship, love, and parenthood. It is just in these affairs of life that the sexes do show the greatest mental differences.

In the second place, outside of courtship, love,

and parenthood, the sexes have been most often compared in the persons of their most eminent representatives. Such a comparison is unfair for the sexes as wholes, because the male sex is the more variable, so that even though the average man is inferior to the average woman in a given trait, the best men in it may be above the best women. So in music and literature, although the experience of schools and life shows women in general to be not inferior to men, the greatest achievements have been by men. The greatest scientists, poets, painters, and musicians have been more frequently males for the same reason that idiots are more often males.

Sex, then, though a real influence, is not so great an influence in making individuals differ as has been supposed. Many traits are practically uninfluenced by it. The variations within one sex are not very much less than the variations amongst men and women together.

THE INFLUENCE OF RACE

Differences in remote ancestry or race account for a very large percentage of the differences

found amongst men, if we consider both their direct effect upon original nature and their indirect effect through the differences in training which commonly parallel them. Even if we disregard the past and confine observation to the differences amongst living men, race directly and indirectly produces differences so great that government, business, industry, marriage, friendship, and almost every other feature of human instinctive and civilized life have to take account of a man's race.

But the effective differences between, say, the modern European, Chinese, and Negro are, in the first place, in part physical. It is not the Negro's soul but his *body* that is despised by many of those who despise him. The European *looks* like a foreign devil to the Chinese. The white man does not boast of his intelligence or virtue, but thanks God that at all events he is a *white* man.

In the second place, clothes, coiffure, physical habits, and all the showy but trivial expressions of intellect and character in customs, ceremonies, and manners, give an impression of fundamental unlikeness that is quite out of proportion to the

real facts. The Quakers were outlawed largely because they kept their hats on! A Chinese must be a queer beast, since he wears a pig-tail! The Hottentot, poor creature, knows no better than to go naked!

For rational control, it is necessary to reach the real differences in intellect and character, unmagnified and undistorted. Further, it is desirable to separate off sharply the direct effect of racial differences upon original natures from their indirect effect through the different civilizations or cultures which happen to accompany them. The influence of the latter belongs properly under the influence of differences in the environment, and will be omitted from consideration here.

If the original mental natures of a hundred Negroes, Chinese, Igorots, and Jews were given similar bodily externals and brought up under the same environment, would they differ more than would a hundred, all Negroes or all Chinese; and if so, how much more and in what ways? That is the present question.

It is a pity that so important a question, by

the answer to which the treatment of the so-called lower by the so-called higher races and the treatment of the latter by one another should be largely guided, can be only so imperfectly answered. It is literally true that we know how to breed and train plants far better than we know how to breed and train men for important traits of human nature. Of the detailed significance of the heredity belonging to each of the races and sub-races of men, little or nothing is known. I can only illustrate the attitude which a student of the topic should take and the general direction in which the truth may be expected to lie. This will be done in the case of racial differences in general intellect.

The first fact to note is that racial differences in original nature are not mere myths. For example, the colored pupils in the public high schools of New York City represent probably at least as good a selection intellectually from the offspring of Negroes and Negro-white crosses as do the white pupils from the offspring of pure white matings. Any superiority of the white to the colored pupils is almost certainly equaled

by the difference between the white race and the Negro race. Yet the white pupils are demonstrably superior in scholarship, as shown in Figure 12.

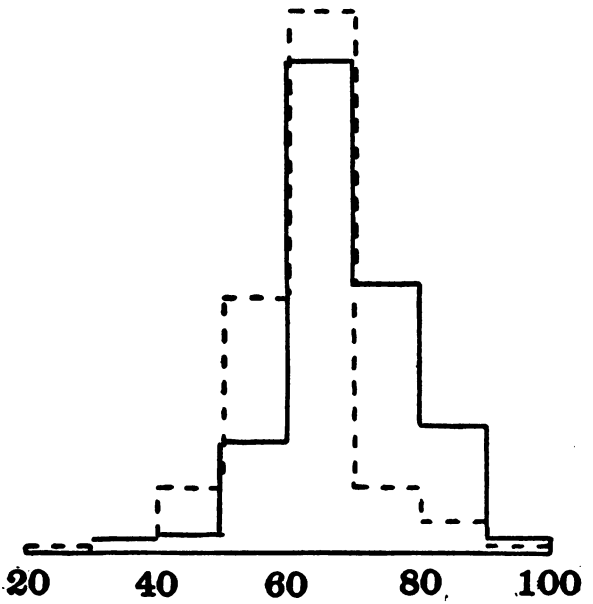

FIG. 12. The Relative Frequencies of Different Marks in the High School in the cases of White Pupils (continuous line) and Colored Pupils (broken lines).

The differences in the environment do not seem at all adequate to account for the superiority of

the whites. To take the one other case of measurements of the intellectual capacities of different races, Woodworth found that the best of the Negritos and reputed Pygmies just reached the average European in a simple test of practical intellect.

The second fact to note is that the differences in intellect due to race, though real, are in general small. In the test by Professor Woodworth, just mentioned, only small differences were found between the Europeans and Indians, Eskimos, Ainus, Filipinos, and Singhalese.

This may seem irreconcilable with the testimony given by the history and present status of races. If racial achievement were a fair measure of intellect, there would be a real contradiction. But achievement is a measure of ability only if conditions are equal. Two important conditions are the size of the racial group and its communication with other races. A small race, though of equal average intellect with a larger race, has not so great a probability of generating an extreme variation, —a man of extraordinary ability, whose discoveries and practices uplift all who can

learn or imitate them. An isolated race in the same way loses the means of progress which come from borrowed ideas and practices.

The third fact of importance is the overlapping. The superiority of a race does not mean the superiority of all its members to all those of the other race. That never happens; and ordinarily the two distributions overlap for nine tenths of their extent along the scale. Even when the average of one race is, say, ten *per cent* more gifted than the average of another, there will still be about nine out of ten of the inferior race who will surpass the worst representative of the superior race, and about four out of ten who will surpass the average man of the superior race. There is, then, hardly a more stupid way of getting individuals of superior original nature than to choose them by race. The variation of original individuality within any one race is too wide.

THE INFLUENCE OF NEAR ANCESTRY

Within any one of the larger groups that we call races there are many strains or "lines," so that, as every one sees in the case of physical

traits, individuals of the same sex, race, and training still differ widely. The same is true of traits of intellect and character. In them also individuals of the same sex and race differ in ways and to degrees that differences in training cannot account for. As will be shown later, the exact dividing line between the influence of inheritance and the influence of environment or training is subject to dispute, but every one who has investigated the facts carefully admits that the former has some influence. Mental and moral inheritance from near ancestry is a fact.

A human being develops from, and in his original nature *is*, an ovum, or germ-cell from the mother, fused with a sperm, or germ-cell from the father. A germ-cell from any parent is always one of many produced by that parent. These vary amongst themselves, so that the possible heredity from any one parent is far wider and richer than his own nature. A man gives to his children, not one thing, himself, but his manifold germs. With respect to any trait, the germs from one parent vary, however, much less than do the germs from all the parents in that race.

Let us call that element or constituent of a germ which tends to produce, in the individual who develops from it, a given feature of intellect or character, that feature's *determiner.* Then the fact just mentioned may be stated in this form: Germs from the same individual differ in their determiners; germs from different individuals of the same race differ still more; germs from individuals of different races, still more.

Inheritance is at bottom a matter of the relations of germs one to another. A parent resembles his offspring because the germ that produced *him* produced also the germs that produce *them.* He differs from his offspring and they differ among themselves for the same reason. The difference is due to the fact that germs produced by one germ vary. The likeness is due to the fact that they vary *less than germs produced by many.*

Our inferences about heredity, however, have to be made from the resemblances and differences of the individuals who develop from the germs. The study of mental and moral heredity is thus the study of the greater resemblance or less

difference of related than of unrelated individuals.

The measurements of the influence of near ancestry upon individuality have naturally taken the form of measurements of the greater resemblances of related individuals, rather than of the greater differences of unrelated individuals. Samples of the results obtained are the following: Call the average likeness of two persons of the same sex and race, but not near kin, *zero*. Call perfect similarity 1. Then the resemblance of father to son in general intellect and also in moral worth is, according to Woods,[1] about .4. The resemblance of brother to brother or sister in various mental traits is, according to Pearson, about .5. The resemblance of twins in ability to add and multiply, in finding the misspelled words in a passage, and in other mental tests is about .8.

It would be too long a task to rehearse the evidence from which it appears that these resemblances are due only slightly to resemblances in home training. Sample arguments are the follow-

[1] Allowance being made for certain facts not taken account of by Professor Woods himself.

ing: Twins are found to grow no more alike from nine to fourteen, in spite of the fact that any influence home training may have upon ability to add, multiply, and the like should be far greater after so much longer action. They are found to be as much alike in finding misspelled words or giving the opposites of words as in adding or multiplying, though, presumably, home training should count more in the latter. Also the home training of twins does not seem to be very much more constant than that of two children of the same family, two or three years apart in age; but the resemblance is twice as great.

On the whole, intellectual and moral individuality seems to be determined to a very large extent in the germs. If all human beings were given exactly the same training, subjected to exactly the same influences from the time of their conception, they would still differ widely. Hygiene, medicine, education, and all social forces have to reckon with original differences in men. Their aims, means, and methods must be adapted to fit not one nature, but many.

INDIVIDUALITY

THE INFLUENCE OF EDUCATION

The intellect and character given to an individual by sex, race, and near ancestry furnish the starting point for the general education which he gets from the fortunes of life and the special education which society prescribes for his and its own good. Sometimes these environmental forces bring him into conformity with others, rounding off the corners of his individuality to make it more like the type: in other cases the environment increases initial differences and adds to the total variety of human nature. To what extent the differences that come to exist amongst individuals are to be attributed to differences in their nurture, is known uncertainly, if at all. I shall attempt only to show the attitude a thinker must take toward the general question.

There is no doubt that differences in home, school, books, friends, political status, and the like, may cause differences in the intellect and character which a man comes to possess, — in his eventual nature. Two identical original natures,

if brought up in 1900 B. C. and 1900 A. D., or in Berlin and Pekin, would result in very different eventual natures. The Japanese of to-day are probably almost or quite identical, in original nature, with their great-grandfathers. All or nearly all of the differences between the two groups are attributable to differences in environment. Any man's individuality is determined in large measure by his language, occupation, religion, customs, and ideas. These again are determined in large measure by his nurture.

But the influence of the environment is subject to two important limitations. Any environmental force has far less effect if it is *avoidable.* If a boy born in China can, if his nature sufficiently impels, go to a modern school, the influence of the old-fashioned Chinese schools, even though they outnumber the modern schools a hundred to one, is far less than if they are the unavoidable form of education.

If the custom of slavery is universal, men who are by original nature just and humane will inhumanly deprive the babies born in slavery of common human rights. But if the custom is called

in question at all, so that the force of society's approval of it is avoidable, — if a man can flee in fact or in thought to the company of those who distrust slavery, — then the effective force of that custom is enormously weakened. A man may, in respect to it, determine his eventual nature by his original nature.

Similarly, before any alcoholic beverages were known, no man, however intemperate his original nature, could be a dipsomaniac. But, once total abstinence is avoidable, the determination of a man's behavior toward liquor may be made largely by his original nature. He may shut his ears to all tales of the misery caused by drink, may not attend to any of the facts which would facilitate abstinence, may respond to all restraining forces by neglect, and seek out, as a result of the inner impulsion of his inborn make-up, the rare opportunities for alcoholic intoxication.

The second limitation to any environmental force is that it acts differentially, the result being determined by the original nature acted upon as well as by the force itself. Even in those who do not avoid it, it has all degrees

of welcome. Being slaves does not make all men slavish, much less equally slavish. Evil communications may ennoble the manners of some men. "The environmental stimulus adequate to arouse a certain power or ideal or habit in one man may be hopelessly inadequate to do so in another. Washing bottles in a drug-shop was, if a common story is true, adequate to decide Faraday's career; and the voyage on the Beagle is reputed to have made Darwin a naturalist for life. But if all the youth of the land were put to work in drug-shops and later sent on scientific expeditions, the result would not be a million Faradays and Darwins, or even a million chemists and naturalists. All that one man may need to be free is a vote; but even a long education in self-direction may be inadequate for another. Being told a few words suffices to secure the habit of reading in one child, while the child beside him remains illiterate after two years of careful tuition. The amount of stimulus required in some cases is so infinitesimal that the power seems to spring absolutely from the man himself. In other men no agency

is found potent enough to arouse a trace of the desired result."

As a result of these limitations, it is hard to find differences between one and another man of the same era and general social condition that are clearly due to differences in training. The great scholar is not made by attendance at a university; rather his own nature made him seek that influence scorned by so many others. Many a drunkard remains so in spite of fewer temptations. Saloons being inaccessible, he drinks at home; whiskey being debarred, he takes to "bitters" or patent medicines; one suspects that if alcohol did not exist, he would soon discover cocaine. Each nature in some measure selects its own environment, and each nature may get from an environment a different influence, so that the relative achievements of, say, the boys who this year begin school in America, will probably be more closely parallel to their relative original talents and interests than to their relative advantages in home and school environment.

III

THE SIGNIFICANCE OF INDIVIDUAL DIFFERENCES

WE have seen that individuals differ in whatever trait of intellect or character is examined. The variations from the ordinary, common, or typical man range continuously to such extreme conditions as appear in the idiot and the genius, or Nero and Lincoln. But the great majority cluster somewhat closely around the "average man." Clear and useful divisions into separate classes are impossible with respect to either the amount of some single trait or the total constitution of the mind.

The differences that characterize men of the same time, country, and social status are largely original, determined directly by the germs from which the individual develops, and so indirectly by the ancestry from which he springs. Each original nature has so great power of selecting and avoiding the forces of social and educational

environment that the fundamental powers, interests, and ideals of such men are largely determined before they are born. Over the particular connections with ideas which we call knowledge, and the particular connections with acts which we call skill, training has greater power; and, of course, unavoidable differences in training, such as go with differences between 1700 and 1900, England and China, slave and free, are far more potent.

All the sciences and arts of controlling human nature must accept the original variety of human nature as a condition for thought and action. The economist must not consider men as all seeking with steadfast rationality to buy as cheap and sell as dear as they can. The religious worker should not hope to arouse uniformly the same sense of guilt and longing for justification to which he and his intimates testify. The scholar may as well expect all men to be passionately eager to use the left rather than the right hand, as expect them to prefer linguistic or mathematical erudition to ignorance. The teacher who has not learned by ordinary experi-

ence that each child is to some extent a separate problem, demanding for his best interest an educational theory and practice to fit *him*, should learn it once for all from psychological theory.

Specialization of schools is needed not only to fit pupils for special professions, arts, trades, and the like, but also to fit the schools to original differences in the pupils. Specialization of instruction for different pupils within one class is needed as well as specialization of the curriculum for different classes. Since human nature does not fall into sharply defined groups, we can literally never be sure of having a dozen pupils who need to be treated exactly alike.

All thought and action will be more reasonable and humane if we look for variety in men and examine each nature in a scientific spirit to learn what it really is, instead of idly judging it by some customary superstition. For example, the most pitiful waste and unreason in human affairs is behavior whereby one makes himself suffer to secure for another a good which is to the other a nuisance or a pain. A parent who sacrifices his own joys to protect his children

against the healthy, beloved, and noble struggles of life; a philanthropist who lessens his own welfare to teach factory-workers refinements, knowledge of which can only embitter their inability to secure them; a religion that spends life in stimulating the fears and worries of men whom fear and worry will never lead to right living, but only to more worry and fear, — in such gratuitous miseries, false diagnosis of human hearts is prolific.

The most necessary elements in the life of reason and justice are, first, an awareness of what individual human natures really are and really want; and then an appreciation of the relative worth of the myriads of wants thus revealed. This valuation of human wants, in turn, is improved chiefly by knowing what they are and how each competes or coöperates with all the others. Only in proportion as such a science of the nature and behavior of individual men exists can man know what his duty is or know how to do it.

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